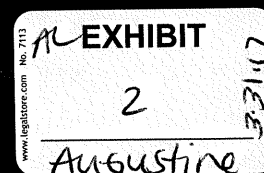
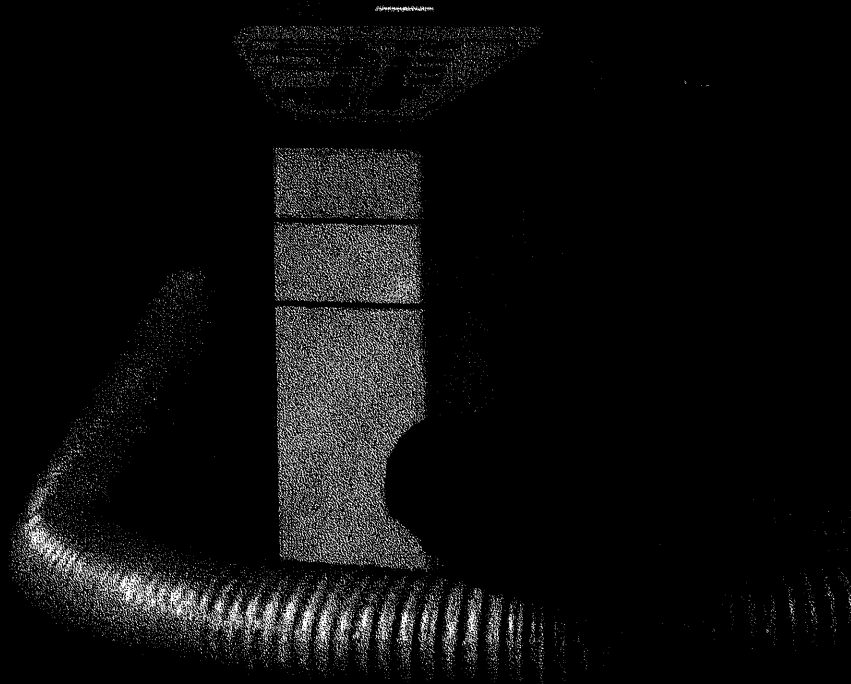


EXHIBIT D

Blowing Air Is Risky



... now there's an [air-free] alternative.

"RESERVOIRS OF INFECTION"

Recent studies show that the air-flow paths of Bair Hugger[®] blowers are frequently contaminated with bacteria.^{2,3} These units blow many millions of germ-sized particles into the operating theatre each hour. No wonder a Department of Public Health in the U.S. called Bair Hugger units "reservoirs of infection."⁵

How are hot-air hoses externally contaminated?

1. Contact with contaminated gloves or fluids
2. Lying on operating theatre floor

"Dry conditions favor the persistence of gram-positive cocci (e.g. Staph) in dust and on surfaces..."⁶

-US Centers for Disease Control

Can hot-air hoses be cleaned? **NO!**

Routine wiping does not remove contaminants from the valleys of the hose. The creases within the 180 corrugations of a 7-foot hose are nearly impossible to clean.

All non-disposable equipment in the operating theatre must be cleaned—especially after exposure to blood, bacteria, and bodily fluids. Non-cleanable equipment is simply unacceptable.

The hose above, carefully wiped with a disinfectant, appears to be clean...it isn't!

A crime scene forensic tool such as Luminol (a chemiluminescent compound that glows blue in the presence of trace blood), clearly shows widespread residual blood in the corrugations of this apparently clean hose.

Contaminated Air is Blowing from the Unit

Particle counters have measured more than **50 million germ-sized particles** per hour blowing from Bair Hugger units into the operating theatre.⁴

Fifty million particles? Where do they come from?

Blowers suck in clean air and pass it through a .2 micron filter—and still they blow millions of germ-sized particles into the operating theatre. Therefore, most of these particles must be originating from inside the blower and hose.

What are these 50 million particles?

Not all of the particles are bacteria, but bacteria can be cultured from both the air and hoses of many hot-air warming units. There should not be any particles, much less germs, blowing from the hose.

Germ colonies can be cultured by swabbing various locations within the unit or hose, or even by impacting the air blowing from the hose onto a culture plate.³

Infection Control and Hospital Epidemiology

reported an outbreak of a multi-drug resistant *Acinetobacter* that was traced directly to the inside of a Bair Hugger machine.²

Despite reports such as this, the manufacturer does not offer a protocol for cleaning the insides of Bair Hugger blowers or hoses.⁷

Are airborne particles dangerous?

"The link between post-operative infection and theatre air quality has been well established."⁸

-UK Hospital Infection Society

A single bacterium can infect a new joint implant.⁹

AIRBORNE CONTAMINATION by blowing hot air

TO CONTAIN MRSA, AIRBORNE TRANSMISSION MUST BE PREVENTED

Leading experts in microbiology from Oxford, Cambridge and the University of London highlighted the MRSA problem in a letter to the *Times* of London. MRSA infections, said these experts, are far more likely to result from airborne transmission than from skin contact or equipment contact. **"Staphylococcus aureus [including MRSA] spreads on millions of tiny skin particles, shed by carriers, drifting in the air...." "To be truly effective, measures to contain MRSA must block airborne transmission."**¹⁰

- Blowing air through a contaminated warming unit may cause bacterial colonies to become airborne.
- Blowing air from a forced-air blanket across the skin may also cause skin particles to become airborne, spreading them into the operating theatre. Infectious agents—such as MRSA—can independently float in moving air or on "rafts" of dead skin particles.¹¹

"We conclude that these warming devices* are a potential source of nosocomial infection."³

*Bair Hugger and Warm Touch®



Introducing the [air-free] solution...



The
NEXT WAVE
in
Patient
Warming

www.HotDogWarming.com

Visit
www.BlowingAirIsRisky.com
for more information

AUGUSTINE
BIOMEDICAL + DESIGN

6581 City West Parkway
Eden Prairie, MN 55344
952-465-3500 (phone) 952-465-3501 (fax)
www.augbiomed.com

References

1. Bair Hugger is a registered trademark of Arizant Inc., Warm Touch is a registered trademark of Tyco Healthcare Group LP
2. A.T. Bernards, PhD, et al. "Persistent *Acinetobacter baumannii*? Look Inside Your Medical Equipment". *Infection Control and Hospital Epidemiology*. 25.1: Nov 2004: 1002-1004.
3. Avidan, M.S.; et al. "Convection warmers - not just hot air". *Anaesthesia*. 52: (1997): 1073-1076.
4. ABD Research
5. Beavers, Suzanne, M.D.; CDR Doug Thoroughman PhD. "Acinetobacter Infections among Hospitalized Patients in Kentucky - 2006". *Kentucky Epidemiologic Notes and Reports*. 42.2: March 2007: 1-3.
6. Schulster L., R.Y. Chinn. "Guidelines for Environmental Infection Control in Health-Care Facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC)". *US Department of Health and Human Services Centers for Disease Control and Prevention (CDC)*. 2003 Jun 6; 52(RR 10).
7. Arizant Inc., Eden Prairie, MN <<http://www.arizant.com>>
8. National Health Service Estates. Health Technical Memorandum 2025: ventilation in healthcare premises. London: HMSO; 1994.
9. Lidwell, O.M., et al. "Bacteria isolated from deep joint sepsis after operation for total hip or knee replacement and the sources of the infections with *Staphylococcus aureus*". *Journal of Hospital Infection*. 4: (1983): 19-29.
10. Dr. Norman A. Simmons and others. "Hygiene not key to fighting MRSA". *Times Online*. 4 March 2004. 18 July 2007. <<http://www.timesonline.co.uk/tol/comment/debate/letters/article418262.ece>>
11. W.C. Noble and R.R. Davies. "Studies on the dispersal of staphylococci". *Journal of Clinical Pathology*. 18.15: (1965).

Rev A